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Press Release

€1.6 m for German-Israeli biochemistry project

DFG sponsors Tübingen professor and international research team investigating mitochondrial functions within the cell

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The German Research Foundation (DFG) has approved a new project under its German-Israeli Project Cooperation scheme. Professor Doron Rapaport from the University of Tübingen's Interfaculty Institute of Biochemistry and an international team will receive a total of nearly 1.65 million euros over five years for their project, called "MitoBalance: Uncovering the mechanisms underlying mitochondrial proteostasis." The researchers seek to understand how mitochondria integrate their protein biogenesis and quality control with those of the rest of the cell.

Professor Rapaport's collaborating partners work at the universities of Kaiserslautern and Cologne in Germany, and the Hebrew University and the Weizmann Institute of Science in Israel. The German-Israeli Project Cooperation scheme was initiated by the German government in 1997 to promote outstanding, innovative German-Israeli research in any area of science and academia.

Mitochondria are abundant organelles, which play an essential role in the metabolism and physiology of cells in plants and in humans and other animals. They have long been seen as tiny power plants, generating energy for cells to run on. But new research shows that they are also important actors in cell signal pathways, and that they play a key role in processes like cell aging and programmed cell death. Mitochondrial defects can lead to a wide variety of muscular, metabolic, and neurodegenerative diseases.

Researchers have spent decades investigating mitochondria as independent organelles; now this ambitious project will examine mitochondria in the context of the whole cell. The international team will investigate how the mitochondria are coordinated with the rest of the cell in the processes in which they form, use, and dismantle proteins. One of the questions to be answered is how proteins are placed in the right location and in the right amount within the cell. For instance, how do they prevent proteins intended for other organelles from ending up inside the mitochondria? And how do mitochondria alert other parts of the cell when

cell stress occurs due to wrongly folded or aggregated proteins - so that the nucleus can act to counter it?

This cooperative research initiative is expected to make an important contribution to understanding the basic processes of biogenesis and the dismantling of mitochondrial proteins at the molecular level. The results could shed light on how a number of human diseases arise.

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